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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,399	08/27/2003	Keiichi Sato	HIRA.0122	5338
38327	7590	01/03/2007	EXAMINER	
REED SMITH LLP			ALANKO, ANITA KAREN	
3110 FAIRVIEW PARK DRIVE, SUITE 1400				
FALLS CHURCH, VA 22042				
			ART UNIT	PAPER NUMBER
			1765	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/03/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/648,399	<b>Applicant(s)</b> SATO ET AL.	
	<b>Examiner</b> Anita K. Alanko	<b>Art Unit</b> 1765	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10/16/06 RCE & IDS.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2 and 3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2 and 3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/16/06</u> . | 6) <input type="checkbox"/> Other: _____  |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/18/06 has been entered.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Gerion et al (*J. Phys. Chem. B* 2001).

Gerion discloses a method comprising the steps of:

modifying semiconductor nanoparticles (with a diameter of between 3 and 14 nm, Fig.5) with oil-soluble materials (coating by TOPO/TOP, starting materials shown in Fig.1; page 8863, “Experimental Section” part “B”) for surface modification (since the coating is on the surface of the nanoparticles);

converting the oil-soluble materials for surface modification into water-soluble materials for surface modification at the interface between an organic solvent and water (last step shown in Fig.1 the functional groups of thiol and phosphate “to tailor the nanocrystal surface

functionality”, or MPA-coated nanocrystals, see page 8862, 2<sup>nd</sup> column, section labeled “Mercaptopropionic Acid-Coated Nanocrystals” ); and

shifting the semiconductor nanoparticles from an organic phase to an aqueous phase by the conversion (since they are soluble in water, p.8868, col.2, lines 15-18).

Gerion discloses to “photobrighten” the nanoparticles by irradiation of aerated solutions (page 8869, col.1, lines 41-42, 48-49), which encompasses the cited size-selective photoetching, thereby regulating particles sizes (since the solution is brightened, some particles are dissolved and the relative monodisperse particles remain in solution) and monodispersing the semiconductor nanoparticles (since the solution is brightened). Since the same critical steps are performed in Gerion as in the instant method, the same results of dissolution of the surface of the semiconductor nanoparticles, peeling, monodispersity and conversion are inherent.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerion et al (*J. Phys. Chem. B* 2001) in view of Torimoto et al (*J Phys Chem B* 2001).

The discussion of Gerion from above is repeated here.

As to claims 2-3, Gerion does not recognize that irradiating the aerated solution causes size-selective etching. Torimoto teaches that size-selective photoetching is a useful technique for forming ultrasmall semiconductor nanoparticles (see for example, "Introduction" and "Conclusion" sections on pages 6838-6839, 6844). Torimoto teaches that the size-selective photoetching can be principally applied to the preparation of any semiconductor nanoparticles that are photocorroded under irradiation (See "Conclusion"). An advantage of obtaining select sizes is to enable the systematical investigation of size-dependent physicochemical properties (p.6858, 2<sup>nd</sup> column, lines 22-24). It would have been obvious to one with ordinary skill in the art to use size selective photoetching, thereby regulating particle sizes, monodispersing them, peeling and converting the materials for surface modification, in the method of Gerion because Torimoto teaches that it is a useful technique for forming small semiconductor nanoparticles.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 2-3 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,911,082 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because transporting "between" an aqueous layer and an organic layer encompasses shifting to an aqueous phase.

### ***Response to Amendment***

The objection to the specification and 35 USC 112 rejections are withdrawn since the claims have been amended to have the same language as in the originally filed claims.

Claims 2-3 remain rejected under 35 U.S.C. 102(b) as being anticipated by Gerion et al (*J. Phys. Chem. B* 2001), and rejected under 35 U.S.C. 103(a) as being unpatentable over Gerion et al (*J. Phys. Chem. B* 2001) in view of Torimoto et al (*J Phys Chem B* 2001).

The claims also remain rejected under double patenting over US 6,911,082 B2.

### ***Response to Arguments***

Applicant's arguments filed 9/18/06 have been fully considered but they are not persuasive to the extent they still apply. Applicants arguments about photoetching,



photobleaching and photobrightening are not commensurate in scope with the claim language.

The claims are not defined differently from any of these words because the claims do not clearly define what photoetching comprises. The prior art still teaches the same steps of irradiation, and therefore the same results are expected. The motivation to combine the teachings of Torimoto and Sato is that Torimoto teaches that size-selective photoetching is useful to prepare monodisperse nanoparticles. The particles of Torimoto may be different, but Torimoto teaches that photoetching may be applied to any nanoparticle. It is obvious to use the technique of Torimoto in Gerion since Gerion desires to form well defined nanoparticles in order to have emission at the desired wavelength/color.

Applicant argues that it is hardly expected that the MPA-coated nanocrystals of Gerion could be photodegraded or photo etched. In response, applicant has not shown how the steps of Gerion are different from the claimed invention. Applicant has described how Torimoto is different, but not how Gerion is different.

As to the 35 USC 103 rejection, applicant has argues that there is no desirability to combine. In response, the desirability to combine is that Torimoto teaches that photoetching can be used for any nanoparticle, and obtaining selective sizes, i.e. monodisperse, is desirable to tailor the physicochemical properties.

As to the double patenting rejection, applicant argues that Sato '082 requires coating with multiple layers. In response, the instant invention broadly cites "materials" which encompasses multiple layers, and is not limited to a single layer. Applicant argues that Sato '082 requires coating with ZnS. In response, the instant invention cites "materials", which encompasses ZnS. Applicant argues that there is no desirability of deleting this step in Sato '082. In response, there

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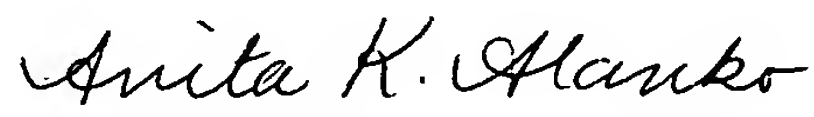
is no need to delete that step since the claims encompass Sato '082. Sato '082 has size-selective photocorrosion of semiconductor nanoparticles that have been transported between an organic layer and an aqueous layer, which, as broadly cited, is the instant invention.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K. Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon-Fri until 2:30 pm (Wed until 11:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Anita K Alanko  
Primary Examiner  
Art Unit 1765